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lungs, penetrated the moist and delicate tissues, and by development occasioned the death of the birds; some antecedent state of the system being admitted as rendering possible the development of the fungus.

Including these new cases, eighteen kinds of birds are recorded as liable to attacks of fungi, either accompanying or causing fatal disease. As they belong to many different groups of birds it may be inferred that the whole class is predisposed to them under special but yet unknown conditions; these moulds, as far as at present definitely determined, belong to two or three species of *Aspergillus*, and derive great importance from the interest at present attached to the investigation and control of cryptogamic causes of disease. —R. H. W.

BOTANY.

Exuberance of Pollen.—For many years I have observed with wonder, in the early summer, or about the month of June, the immense amount of pollen scattered in the vicinities where coniferous trees and shrubs are abundant. On the Great Lakes I have often noticed the surface of the water covered for miles with a thick coating of this yellowish deposit, looking as if it was strewn with sulphur, which in calm weather continued for days together. At times, indeed, it is so difficult to get the water free from the pollen that it is rather unpleasant for drinking, cooking, or washing purposes.

In walking through grounds where the Juniper (*Juniperus communis* Linn.) covered the sterile soil, I have frequently noticed the clouds of golden dust which I raised, and that my boots were yellow from the pollen. What remarkable prodigality this displays on Nature's part. It is difficult to conceive a use for the pollen thus spread over the land and the lake waters; though there may be one hidden from us.

This superabundance of the male principle, which seems to be the rule throughout Nature, is a peculiarly interesting and suggestive fact, and worthy of more investigation and thought than it has heretofore received.

In plants, insects carry off a considerable quantity of the pollen: bees, for example, to make bee-bread; and we may know a few more instances of its use besides its legitimate one of fertilization. But all of these taken together would scarcely make more than a small fraction of the amount of this life-dust covering with its thick sulphur-colored coat a single square mile of the surface of Lake Huron or Lake Superior.—Henry Gillman, *Detroit, Michigan.*

Double Flowers of Ranunculus rhomboideus.—Specimens of this are sometimes found in Floyd County, Iowa, with perfectly double flowers. I have found several plants, and one of these I transferred to a bed in the flower-garden, where it thrived finely and increased to a clump six inches in diameter, which the next spring was perfectly enveloped with the little bright yellow flowers. No seeds were produced; and during the two or three seasons in which the plant was cared for there was no sign of change to single flowers. The plant was quite attractive; and as it blooms very early and profusely, it would seem to have some of the qualities required to entitle it to a place among cultivated flowers.—J. C. Arthur, *Iowa Agr. College.*

[To be sure; being a dwarf species, it would be desirable, and Prof. A. might make a little money, while doing a good thing, by propagating the plant, and introducing it through the florists. In acknowledgment of the hint, send us, please, a good root of it.—Eds.]

Quercus alba, var. Gunnissonii.—In Watson's report, Hall and Harbor's Rocky Mountain *Quercus Douglassii* var. *Neo-Mexicana*, is said to be *Q. alba*, var. *Gunnissonii.* My specimens are as much like Hall and Harbor's as if they had been taken from the same plants. I can therefore speak of the living trees as I saw them, and, without regard to their identity with *Q. Gunnissonii*, would suggest a doubt as to the propriety of their reference to *Q. alba.*

I have had experience with trees in a living state of both European and American species, and the idea left on my mind after journeying several days through tracts on which this oak in question grew, was that it partook more of the character of *Quercus robur* than of *Q. alba.* Among the European species I have noticed a remarkable tendency in some plants of *Quercus cerris* to approach *Q. robur;* and among these Rocky Mountain forms were many which had the leaves and general appearance of the branches much like *Quercus cerris.* This was especially the case with some low growing plants (about three feet high), about a day's journey north of Pike's Peak. South of Pike's Peak were some nearly fifteen feet high. None had the bark of *Q. alba*, but in other respects favored *Q. robur* rather than *Q. alba*.

I know how easy it is to be mistaken. Though I do not think Mr. Watson is right, I am by no means certain of my own view. I write merely to suggest that full reliance be not placed on this supposed relationship without a fuller examination. A few years ago it would be deemed a matter of very little consequence; but as the question of evolution has risen to such magnitude, such facts as these are worthy of the most careful scrutiny. As a general rule it struck me that, accepting the theory of evolution as true, the plants of the Rocky Mountain region of Colorado favored a derivation from European rather than Eastern American forms, and that this oak was one of the instances.—THOMAS MEEHAN.

THE FORMATION OF OZONE BY FLOWERS.—It has been found by Mantegazza (*Rendiconti del Reale Istituto Lombardo*, vol. iii. fasc. vi., abstracted in *Der Naturforscher*, 27th April) that many essential oils, like that of peppermint, turpentine, oil of cloves, lavender, bergamot, aniseseed, nutmeg, thyme, and others, when in contact with the oxygen of the atmosphere in presence of sunlight, develop very large quantities of ozone. The oxidation of these oils is, in fact, a very convenient source of ozone, as they, even in small quantities, ozonize much oxygen. The action is strongest in direct sunlight, far less so in suffused daylight, and very weak or at an end in the dark. The development of ozone which has been begun in the light continues for a long time in darkness. In the same manner act eau-de-cologne, hydromel, and other aromatic tinctures on exposure to the solar rays. Experiments which Mantegazza has made on flowers with powerful perfume, such as the narcissus, hyacinth, heliotrope, mignonette, and others, in closed vessels, proved that they also form ozone. Those with fainter perfume produced less ozone, those without scent none at all. Mantegazza believes that this important source of ozone is of hygienic value for the purification of the air of marshy districts. —*Academy*.

JUNIPERUS OCCIDENTALIS.—Mr. Watson remarks that this species has not yet been found in Colorado. It grows on the low hills to the eastward of Pike's Peak; not abundantly, but together with larger quantities of *Juniperus Virginiana.* It here makes but a low stubby tree of from fifteen to twenty feet high; but with very stout trunk in proportion to its low stature.—THOMAS MEEHAN.

WILD DOUBLE-FLOWERED EPIGÆA REPENS is received from Worcester by Mr. Arba Pierce, who has gathered similar flowers from the same plant for several years. The doubling comes from the partial conversion of the stamens into petals, the outer and most transformed series more or less coalescent into a tube.—A. GRAY.

EXPERIMENTS ON HYBRIDIZATION. — Mr. J. Anderson-Henry, one of our most skilful horticulturists, is contributing to "The Garden" the details of some important experiments on pure hybridization, or crossing distinct species of plants. He finds that in those plants which possess two series of stamens, one long and one short, the results vary essentially according as the pollen is used from one or the other series to effect the fertilization. He uses the short stamens only in all cases where he wishes to cross a large on a small species, and with the most successful results. The converse also he finds to hold good, remarkable hybrids being produced by using the long stamens where he wished to cross a small on a large species. The reason of this he considers to be that the shorter stamens contain pollen of smaller grains, and therefore better fitted to emit its tubes through the style to fertilize the ovules of the smaller species, and *vice versâ.* The plants chiefly operated upon by Mr. Anderson-Henry are various species of Geranium, Rhododendron, and Azalea.—*Academy.*

CALYPSO.

(A rare Orchid of the North.)

BY W. W. BAILEY.

Calypso, goddess of an ancient time,
(I learn it not from any Grecian rhyme,
And yet the story I can vouch is true)
Beneath a pine-tree lost her dainty shoe.

No workmanship of mortal can compare
With what's exhibited in beauty there,
And looking at the treasure 'neath the tree,
The goddess' self I almost hope to see.

The tints of purple and the texture fine,
The curves of beauty shown in every line,
With fringes exquisite of golden hue,
Perfect the wonders of the fairy shoe.

The goddess surely must have been in haste,
  Like Daphne fleeing when Apollo chased,
And leaving here her slipper by the way,
  Intends to find it on another day.

And will she come to seek it here or no?
  The day is lengthening but I cannot go,
Until I see her bring the absent mate
  Of this rare beauty, though the time is late.

I watch, but still no classic form I see,
  Naught but the slipper 'neath the forest tree;
And so, for fear of some purloining elf,
  The precious relic I secure myself.

ZOOLOGY.

New Birds in Southern Illinois.—In the summer of 1871 the following species were noticed, and two of them obtained, by the writer, in Richland and Wabash Counties, in the south-eastern portion of Illinois, about latitude 38°, 25′:—*Vireo Bellii*, *Peucœa œstivalis*, *Cyanospiza ciris*, *Asturina plagiata* and *Falco Mexicanus.* The *Vireo Bellii* was found to be a common, or at least not rare, species in the thickets on the prairies. It was first seen on the 8th of June, when specimens were shot, and being then in full song, there can be little doubt that the species breeds there. The *Peucœa œstivalis*—a bird heretofore found only in South Carolina, Georgia, Florida, etc.—was found to be a common species in Wabash County, in old fields bordering on road-sides. As specimens of both old and young were obtained (on the 11th and 14th of August), and the former being in full song throughout the summer, there can be no doubt that the species breeds there. *Cyanospiza ciris* was seen only once—on the 10th of June—when it was observed in Wabash County, in an open thicket in the corner of an old weedy field. As the locality was not visited again, it is possible that the species may have been nesting there. *Asturina plagiata* was seen, and twice shot at, on the 19th of August, 1871, on Fox prairie, in Richland Co. I came across it while hunting Swallow-tailed and Mississippi kites (*Nauclerus forficatus* and *Ictinia Mississippiensis*), and while being annoyed by several of the latter, was well seen—it being immediately overhead—and shot at; it was afterwards followed a long distance among the trees which grew in a ravine intersecting the prairie, but finally lost. There can not be the slightest doubt as to the proper identification of the species, which I have been well acquainted with for years, and one which